Artificial Intelligence Applications for Industry 4.0: A Literature-Based Study

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Abstract

Artificial intelligence (AI) contributes to the recent developments in Industry 4.0. Industries are focusing on improving product consistency, productivity and reducing operating costs, and they want to achieve this with the collaborative partnership between robotics and people. In smart industries, hyperconnected manufacturing processes depend on different machines that interact using AI automation systems by capturing and interpreting all data types. Smart platforms of automation can play a decisive role in transforming modern production. AI provides appropriate information to take decision-making and alert people of possible malfunctions. Industries will use AI to process data transmitted from the Internet of things (IoT) devices and connected machines based on their desire to integrate them into their equipment. It provides companies with the ability to track their entire end-to-end activities and processes fully. This literature review-based paper aims to brief the vital role of AI in successfully implementing Industry 4.0. Accordingly, the research objectives are crafted to facilitate researchers, practitioners, students and industry professionals in this paper. First, it discusses the significant technological features and traits of AI, critical for Industry 4.0. Second, this paper identifies the significant advancements and various challenges enabling the implementation of AI for Industry 4.0. Finally, the paper identifies and discusses significant applications of AI for Industry 4.0. With an extensive review-based exploration, we see that the advantages of AI are widespread and the need for stakeholders in understanding the kind of automation platform they require in the new manufacturing order. Furthermore, this technology seeks correlations to avoid errors and eventually to anticipate them. Thus, AI technology is gradually accomplishing various goals of Industry 4.0.